

AMENDMENTS TO THE CLAIMS:

1. (Previously Amended) A Q-switched laser, comprising:
  - a polarization-dependent resonant cavity including a fiber chain having a gain medium between narrowband and broadband fiber gratings, at least one of said fiber gratings and said gain medium being formed in a non-polarization maintaining (PM) fiber;
  - a pump source that couples energy into the fiber chain to pump the gain medium; and
  - a modulator that applies stress to a non-PM portion of the fiber chain to induce birefringence and switch the cavity Q-factor to alternately store energy in the gain medium and then release the energy in a laser pulse.
2. (Original) The Q-switched laser of claim 1, wherein at least a portion of the fiber chain comprises a polarization-dependent fiber.
3. (Previously Amended) The Q-switched laser of claim 1, wherein the narrowband fiber grating is formed in a polarization maintaining (PM) fiber creating a pair of reflection bands that correspond to different polarization modes, said broadband grating is formed in the non-PM fiber having a reflection band that is aligned to one of the narrowband grating's reflection bands.
4. (Original) The Q-switched laser of claim 1, wherein the modulator comprises a piezoelectric transducer (PZT).
5. (Cancelled)
6. (Original) The Q-switched laser of claim 1, wherein

the retardance of the birefringence is approximately one-quarter wave of the laser pulse.

7. (Original) The Q-switched laser of claim 1, wherein the gain medium is formed in an oxide-based multi-component glass fiber and the gratings are formed in passive silica fiber fused at either end of the multi-component glass fiber.

8. (Original) The Q-switched laser of claim 1, wherein the length of the resonator is less than 5 cm and the laser pulse is single-frequency.

9. (Previously Amended) The Q-switched laser of claim 1, wherein full-width half-maximum of the laser pulse is less than 100 ns, the repetition rate of the laser pulse is at least 1 kHz, and the peak power of the laser pulse is at least 1 W.

10. (Currently Amended) The Q-switched laser of claim 1, wherein the modulator applies stress to the non-PM portion of the fiber chain that does not include the gain medium.

11. (Previously Amended) The Q-switched laser of claim 1, wherein said fiber chain includes only contiguous section of PM fiber.

12. (Previously Amended) A Q-switched laser, comprising:  
a polarization-dependent resonant cavity comprising,  
a gain fiber,  
a narrowband grating formed in a polarization  
maintaining (PM) fiber spliced to one end of the gain

fiber, said narrowband grating in said PM fiber having two reflection bands that correspond to different polarization modes,

a broadband grating formed in a non-PM fiber spliced to the other end of the gain fiber, said broadband grating having a reflection band that is aligned to one of the narrowband grating's reflection bands;

a pump source that couples energy into the resonant cavity to pump the gain fiber; and

a modulator that applies stress to the non-PM fiber in the fiber chain to induce birefringence and switch the cavity Q-factor to alternately store energy in the gain medium and then release the energy in a laser pulse.

13. (Previously Amended) The Q-switched laser of claim 12, wherein the resonant cavity comprises only one section of PM fiber.

14. (Previously Amended) The Q-switched laser of claim 13, wherein the one section of PM fiber comprises the PM fiber in which the narrowband grating is formed spliced to a PM gain fiber.

15. (Original) The Q-switched laser of claim 12, wherein the gain fiber is formed of an oxide-based multi-component glass and the gratings are formed in passive silica fiber fused at either end of the multi-component glass fiber.

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Currently Amended) A Q-switched laser, comprising:

a resonant cavity including a narrowband reflector in a polarization maintaining (PM) fiber creating a pair of reflection bands that correspond to different polarization modes ~~having a polarization dependent reflection band centered at a laser wavelength,~~ a gain medium and a broadband reflector having a reflection band that ordinarily overlaps one of the narrowband reflector's reflection bands ~~the polarization dependent reflection band~~ so that the cavity has a high Q-factor at ~~the~~ a laser wavelength and polarization;

a pump source that couples energy into the resonant cavity to pump the gain medium; and

a modulator that affects the polarization of light oscillating in the resonant cavity to reduce the Q-factor to store energy in the gain medium and then return the Q-factor to its high value to release the energy in a laser pulse.

21. (Previously Amended) The Q-switched laser of claim 20, wherein the reflectors and gain medium are formed in a fiber chain, said modulator applying stress to a non-polarization maintaining portion of the fiber chain to alter its birefringence and change the polarization of the light.

22. (cancelled)

23. (Previously Amended) A Q-switched laser, comprising:

a polarization-dependent resonant cavity including a fiber chain having a gain medium between first and second fiber gratings, at least one of said gratings formed in a non-polarization maintaining (PM) fiber and at least one of said gratings or said gain medium formed in a PM fiber;

a pump source that couples energy into the fiber chain to pump the gain medium; and

a modulator that applies stress to a non-PM portion of the fiber chain to induce birefringence having polarization axes in the cross-section of the stressed fiber chain and switch the cavity Q-factor to alternately store energy in the gain medium and then release the energy in a laser pulse.

24. (Previously Amended) The Q-switched laser of claim 23, wherein one of the fiber gratings is formed in the PM fiber.

25. (Previously Presented) The Q-switched laser of claim 23, wherein the fiber chain includes only one section of PM fiber including said other grating and/or said gain medium.

26. (Previously Presented) The Q-switched laser of claim 24, wherein said first fiber grating is a narrowband grating that is formed in said PM fiber and said second fiber grating is a broadband grating that is formed in said non-PM fiber.

27. (Previously Presented) The Q-switched laser of claim 23, wherein the modulator applies stress to the non-PM portion of the fiber chain that does not include the gain medium.